

STA 4504/5503: Categorical Data Analysis
Fall 2024

UF Course Catalog: Description and inference using proportions and odds ratios, multi-way contingency tables, logistic regression, and other generalized linear models, application of log-linear models. Prerequisite: STA 3024 or STA 3032 or STA 4210 or STA 4322.

Instructor: Beth Johnson
Office: 116-A Griffin-Floyd Hall

Email: ejohnson5@ufl.edu
Telephone: 352-273-1897

Instructor Office Hours: TBD
Graduate Teaching Assistant: TBD
GTA Office Hours/Location: TBD

Course Description and Objectives

Tuesday

Time: 11:45am – 12:35pm
Place: FLG 0220

Thursday

Time: 11:45am -1:40pm
Place: RNK 0110

Course Description: This course will cover a wide range of analysis techniques used when dealing with categorical data. Course content includes description and inference for binomial and multinomial observations using proportions and odds ratios; multiway contingency tables; generalized linear models for discrete data; logistic regression for binary responses; multi-category logit models for nominal and ordinal responses; inference for matched pairs and correlated clustered data; loglinear models.

Course Objectives: At the end of the course a student should:

- be able to identify and analyze categorical variables.
- be able to calculate and interpret odds ratios and relative risks and associated inference procedures.
- be able to apply statistical tools to make inference about a single binomial proportion or two sample proportions.
- understand and be able to calculate the different goodness of fit statistics.
- understand and explain the properties of different measures of association by estimating various forms of measures of association from retrospective, cross-sectional and prospective studies.
- be able to analyze three-way tables.
- understand the fundamental importance of the logistic model.

Required Course Materials

Textbook: An Introduction to Categorical Data Analysis, 3rd Edition, Author(s): A. Agresti
ISBN-13: 9781119405269

Scientific or Graphing Calculator: You will need a calculator capable of basic arithmetic operations and taking square roots will be needed for in-class exams. Internet-enabled electronic devices, such as cell phones or tablets, cannot be used as calculators during exams.

Web-enabled device: You will need some type of web-enabled device such as a laptop, smartphone, or tablet to use in-class to access Canvas as needed.

Course Resources

The Canvas, <https://lss.at.ufl.edu/>, course website will be used extensively throughout the semester to post notes and make course announcements. You must log on using your Gatorlink username and password and access the course webpages from there. Important information about the course will be posted here including this syllabus, announcements, notes, assignments and your grades throughout the semester and computer output to supplement the examples done in class.

Course Computer Programs and Applets

Some assignments will require you to use statistical applets or the statistical software package R to analyze and visualize data.

Study Approach

You are to read the posted course notes and the corresponding textbook sections before class to familiarize yourself with the material and its organization. The course notes will be posted on Canvas. Next, you should carefully re-read the course notes and textbook sections after each lecture to increase understanding. Remember to use the notes to help you to complete all assignments.

Help

Remember to ask for help! You can come by during my scheduled office hours or make an appointment to see me. I can also answer some questions via email. *Emails received during the working week will be answered within 24 hours, however emails received over the weekend may not be answered until Monday morning.*

- **Always use GatorMail for email. I do not check Canvas inbox regularly.**
- **Always put STA 4504 and section in the subject line of your email.** I teach multiple courses and use course numbers to search emails from students.

Course Assignments

Your final course grade will be based on a combination of assessment types including Canvas quizzes, group class projects, and in-class exams. Due dates will be posted on the course schedule, on the Canvas course page and announced in class.

Class Projects/Homework:

Participation is an important component of this course as we learn by doing, so **non-attendance on a class project day will result in a 10% penalty on your individual lab score.** There will be a total of five class activities/homeworks to provide you with experience working with data on small, guided activities. You will work with an assigned group to work with on the assignment, but **everyone is required to submit their own assignment to be graded.** Groups will be rotated during the semester.

Due dates for the lab activities will be posted on Canvas. There will be a 10% penalty per day for late work and no assignments will be accepted more than one day after the due date.

Quizzes:

Quizzes will be assigned during the semester to help you develop a more in-depth understanding of the material and help you prepare for the exams. Some quizzes may contain material from previous topics or exams as a continual review of the material.

Due dates for all quizzes will be posted on Canvas. There will be a 10% penalty for late work and no assignments will be accepted more than one day after the due date.

*Your lowest quiz score will be dropped provided that you have completed all 11 quizzes.

Exams:

There will be three in-class exams which will contain a combination of multiple-choice and short answer and extended response items. For in-class exams, students must bring: their student ID number, picture ID, a calculator, and pencils. **In case of conflict or illness: if a student is unable to take an exam at the scheduled time, they must get in touch with the instructor prior to the exam time for any arrangements to be made for a makeup exam date. Each case will be reviewed individually.** Valid and detailed documentation is a prerequisite under such extenuating circumstances. A grade of zero is the minimum punishment of any type of dishonesty on an exam.

You will be allowed a double-sided, one-page formula sheet on the exam. This sheet must be handwritten and be on a standard 8.5" by 11" sheet of paper.

Grading Scheme:

Exam #1	21%
Exam #2	21%
Exam #3	13%
Quizzes (Best 10 of 11*)	20%
Class Activities/Homework	25%

Numeric Score	Letter Grade
92-100	A
89-91	A-
86-88	B+
82-85	B
79-81	B-
76-78	C+
69-75	C
66-68	C-
60-65	D
0-59	E

Your final overall numeric score is rounded to the nearest integer.
 So, for example, if your average is 76.4 your grade will be 76.
 If your grade is 76.5, your grade will be 77.

Letter grades will be assigned according to the table shown.

The instructor reserves the right to adjust the percentages if needed.

Course Policies**Grading Policies:**

Requirements for class attendance and make-up exams, assignments, and other work in this course as well as policies regarding absences, religious holidays, illness, and student athletes are consistent with UF Attendance Policies.

Additional make-up policy requirements:

- Every effort should be made to complete the assignment/exam during the open period. Only extreme situations will warrant a makeup. Contact the instructor prior to the exam - as soon as you realize you will be unable to take the assignment/exam at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup under such extenuating circumstances.
- If you have an emergency on the day of the assignment/exam, the instructor must be contacted by midnight on the day of the assignment/exam.
- Make-up exams will be scheduled within a week of the assignment deadline. The student is responsible for attending scheduled make-up. Instructor reserves the right to utilize the UF posted final exam day as a make-up date.
- The UF Religious Holidays Policy is available at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/#religiousholidaystext>.
- Additional Note: Being on vacation or booking a trip prior to the completion of the semester is not a valid reason to request a makeup. Please reference the most recent Academic Calendar, <https://catalog.ufl.edu/UGRD/dates-deadlines/pdfs/>.

*If you have a disability that requires academic accommodation, contact the Disability Resource Center (DRC). The DRC will provide documentation to the students who must then provide this

documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

* Incompletes are only assigned when extraordinary circumstances (such as an accident, or extended hospitalization), arising after the date for dropping the course, prevent the student from completing the course requirements. Having a failing grade in the course is not a valid reason for requesting an Incomplete. Information on Medical Withdrawal can be found at <https://umatter.ufl.edu/> . Information on how to Drop a class can be found in UF's Academic Catalog <https://catalog.ufl.edu/> and <https://catalog.ufl.edu/UGRD/academic-regulations/dropping-courses-withdrawals/>

*There is no “extra credit” or forgiven grades – you are responsible for all your work done (or left undone).

*If you have a question concerning a graded assignment, you should notify me within seven days after a graded assignment is posted to schedule a meeting.

Honor Code on Exams: You are required to abide by the University of Florida Student Honor Code. Any violation of the academic integrity expected of you will result in a minimum academic sanction of **a failing grade on the assignment or assessment**. Any alleged violations of the Student Honor Code will result in a referral to Student Conduct and Conflict Resolution. Please review the Student Honor Code and Student Conduct Code at sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

Classroom Behavior: During class students should silence their cellular phones and refrain from eating, drinking, reading newspapers, doing homework, listening to music, excessive talking and all other behaviors that are distracting and disrespectful to the instructor and their fellow students.

Privacy Policy: Student records are confidential. Only information designated “UF directory information” may be released without your written consent. This applies to parents or anyone else who contacts me about your grades.

Faculty Course Evaluations: Student feedback is welcomed by the instructor and beneficial to future students in the course. Students are requested to provide feedback on the quality of instruction in this course by completing a brief confidential evaluation towards the end of the semester at <https://evaluations.ufl.edu>. Summaries of the evaluation results can be found at <https://evaluations.ufl.edu/results>.

Other University Services

U Matter, We Care: Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

***Sexual Assault Recovery Services (SARS): Student Health Center, 392-1161**

***University Police Department, 392-1111 (or 9-1-1 for emergencies), <http://www.police.ufl.edu>**

***Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need or visit the Student Health Care Center website.

***GatorWell Health Promotion Services:** For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

			Tentative Fall 2024 Schedule	Class Activities (CA)	Quiz Date
Date	Day	Topic	Topic		
22-Aug	R	1	Statistical Prerequisites		
		1	Statistical Prerequisites		
27-Aug	T	2	Discrete Distributions		Q1
29-Aug	R	2	Discrete Distributions		
		3	Statistical Inference for a Single Proportion		
3-Sep	T	3	Class Work Day	CA #1 (T1-T3) - Due 9/10	Q2
5-Sep	R	4	Describing Contingency Tables		
		4	Describing Contingency Tables		
10-Sep	T	5	Inference for I x J Contingency Tables		Q3
12-Sep	R	5	Inference for I x J Contingency Tables		
		5	Inference for I x J Contingency Tables		
17-Sep	T	4-5	Class Work Day	CA #2 (T4-T5) - Due 9/24	Q4
19-Sep	R	6	Association in Three-Way Contingency Tables		
		6	Association in Three-Way Contingency Tables		
24-Sep	T	1-6	Review		Q5
26-Sep	R		Exam 1: Topics 1-6		
			Exam 1: Topics 1-6		
1-Oct	T	7	Generalized Linear Models		
3-Oct	R	8	Poisson Regression		
		8	Poisson Regression		
8-Oct	T	9	Poisson Regression: Rate Models and Overdispersion		Q6
10-Oct	R	9	Poisson Regression: Rate Models and Overdispersion		
		7-9	Class Work Day	CA #3 (T7-T9) - Due 10/17	
15-Oct	T	10	Loglinear Models for Contingency Tables		Q7
17-Oct	R	10	Loglinear Models for Contingency Tables		
		11	Logistic Regression		
22-Oct	T	11	Logistic Regression		Q8
24-Oct	R	10-12	Class Work Day	CA #4 (T10-12) - Due 10/31	
		12	Selecting a Logistic Regression Model		
29-Oct	T	12	Selecting a Logistic Regression Model		Q9
31-Oct	R	13	Inference for Matched Pairs		
		13	Inference for Matched Pairs		
5-Nov	T	7-12	Review		
7-Nov	R		Exam 2 Topics 7-12		
			Exam 2 Topics 7-12		
12-Nov	T	14	Multicategory Logit Models		Q10
14-Nov	R	14	Multicategory Logit Models		
		13-14	Class Work Day	CA #5(T13-14) -Due 11/21	
19-Nov	T	15	Classification and Prediction		Q11
21-Nov	R	15	Classification and Prediction		
		15	Classification and Prediction		
			Thanksgiving Break Nov 25-29		
3-Dec	T		Exam 3 Topics 13-15		